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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,130	07/16/2003	Shenggao Liu	005950-836	2442

7590

04/19/2005

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EXAMINER

SHIAO, REI TSANG

ART UNIT	PAPER NUMBER
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1626

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/622,130

Applicant(s)

LIU ET AL.

Examiner

Robert Shiao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on responses filed on 01/24/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 22-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 26-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/12/04, 7/06/04 *q 17/8/03*
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This application claims benefit of the provisional application: 60/397,367 with a filing date 07/18/2002.
2. Claims 1-37 are pending in the application.

Responses to Election/Restriction

3. Applicant's election with traverse of Group I claims 1-21, 26-37, in part, in the reply filed on January 24, 2005, is acknowledged. The traversal is on the grounds that Groups I-IX are closely related, and they can be searched and examined without serious burden, and MPEP 803 and In re Weber, 580 F.2d 455, 198 USPQ 328 (CCPA 1978) are cited. This is found persuasive, in part, and the reasons are given, *infra*.

Status of the Claims

4. Claims 1-37 are pending in the application. The scope of the invention of the elected subject matter is as follows:

Claims 1-21, 26-37, in part, drawn to heterodiamondoid compounds (i.e., formula I) having one heteroatom, wherein one heteroatom is selected from nitrogen, phosphorus, selenium, aluminum, or arsenic thereof (i.e., Se, Al, N, P or As) thereof, and wherein the functional groups (i.e., variables R¹-R⁶) of heterodiamondoid compounds is not selected from a group having heteroaryl or heterocycle moiety.

The above mentioned withdrawn compounds which are withdrawn from consideration as being for non-elected subject matter differ materially in structure and

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composition from the compounds of the elected invention. The withdrawn heterodiamondoid compounds contain nucleus heteroatom other than nitrogen, phosphorus or arsenic (i.e., O, S, B, Si, etc), and varying secondary functional groups (i.e., heteroaryl or heterocycloalkyl) which differ from those of the elected invention, such as tetrahydropyran, oxazole, diazole, pyridine, morpholine, etc, which are chemically recognized to differ in structure and function. This recognized chemical diversity of the functional groups can be seen by the various classification of these functional groups in the U.S. classification system, i.e., class 549 subclass 356(+) (tetrahydropyran), class 548 subclass 215(+) (oxazole), class 548 subclass 300.1(+) (diazole), class 546 subclass 249 (+) (pyridine), class 544 subclass 106(+) (morpholine), etc. Therefore, again, the compounds which are withdrawn from consideration as being for non-elected subject matter differ materially in structure and composition and have been restricted properly.

The Markush group set forth in the claims includes both independent and distinct inventions, and patentably distinct compounds (or species) within each invention. However, this application discloses and claims a plurality of patentably distinct inventions far too numerous to list individually. Moreover, each of these inventions contains a plurality of patentably distinct compounds, also far too numerous to list individually. Moreover, the examiner must perform a commercial database search on the subject matter of each group in addition to a paper search, which is quite burdensome to the examiner.

Claims 1-21, 26-37, in part, embraced in above elected subject matter, are

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prosecuted in the case. Claims 1-21, 26-37, in part, not embraced in above elected subject matter, and claims 22-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention.

The requirement is still deemed proper and is therefore made **FINAL**.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1-21, and 26-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter "heterodiamondoid", "higher diamondoid nucleus" and "replaced by a heteroatom", which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention, see claim 1 or 10, lines 1-3. Incorporation of the limitation of "a heterodiamondoid compound" into the claims respectively would obviate the rejection, i.e., formula I and limitation of the variable G (i.e., triamantane or tetramantane), limitation of a replaced heteroatom (i.e., Se, Al, N, P, or As), and variables R¹-R⁶, see page 7-9.

6. Claim 1-21, and 26-37 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the instant heterodiamondoid

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nucleus having four amantane or replaced by a heteroatom N, does not reasonably provide enablement for the instant heterodiamondoid nucleus having more than four or five amantane, or replaced by a heteroatom Ni. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

For rejections under 35 U.S.C. 112, first paragraph, the following factors must be considered (In re Wands, 8 USPQ2d 1400, 1988):

- 1) Nature of invention.
- 2) State of prior art.
- 3) Level of ordinary skill in the art.
- 4) Level of predictability in the art.
- 5) Amount of direction and guidance provided by the inventor.
- 6) Existence of working examples.
- 7) Breadth of claims.
- 8) Quantity of experimentation needed to make or use the invention based on the content of the disclosure.

See below:

1) Nature of the invention.

The claim is drawn to a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom.

2) State of the prior art.

The reference Ishii et al. 6,235,851 does not indicate which compounds of instant compounds may be useful in the claimed invention. Ishii et al. '851 is pertaining to polymerizable adamantane derivative and process for producing the same.

3) Level of ordinary skill in the art.

The level of ordinary skill in the art is high. Applicants claim a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom. Applicant's specification does not enable the public to prepare such a numerous processes using "a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom", i.e., wherein heterodiamondoid nucleus having more than four or five amantane, or replaced by a heteroatom Ni, etc., by the instant examples disclosed in the specification.

4) Level of predictability in the art.

Applicants claim a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom, remains highly unpredictable, see claims 1 and 10, lines 1-3. Different types of the genus of the compositions "a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom" in the specification, there would be little predictability in the scope of claimed processes.

5) Amount of direction and guidance provided by the inventor.

Applicants claim a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom, encompasses a vast number of compounds. Applicant's limited guidance does not enable the public to disclose such a numerous amount of "a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom" in the specification". There is no enablement for "a heterodiamondoid compound without limitation of numbers of diamondoid nucleus and heteroatom", i.e., the instant heterodiamondoid nucleus having more than four or five

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amantane, or replaced by a heteroatom Ni, etc., many of which are neither enabled nor supported in the specification.

6) Existence of working examples.

Applicants claim a heterodiamondoid compound without limitation of numbers of diamonoid nucleus and heteroatom, encompasses a vast number of compounds. Applicant's limited working examples do not enable the public to prepare such a numerous "a heterodiamondoid compound without limitation of numbers of diamonoid nucleus and heteroatom". Applicants claim "a heterodiamondoid compound without limitation of numbers of diamonoid nucleus and heteroatom", however, the specification provides only limited examples of compositions.

7) Breadth of claims.

The claim is extremely broad due to the vast number of possible "a heterodiamondoid compound without limitation of numbers of diamonoid nucleus and heteroatom".

8) Quantity of experimentation needed to make or use the invention based on the content of the disclosure.

The specification did not enable any person skilled in the art to which it pertains to make or use the invention commensurate in scope with this claim. In particular, the specification failed to enable the skilled artisan to practice the invention without undue experimentation. The skilled artisan would have a numerous amount of modifications to perform in order to obtain "a heterodiamondoid compound without limitation of numbers of diamonoid nucleus and heteroatom" as claimed. Based on the unpredictable nature

of the invention and state of the prior art and the extreme breadth of the claims, one skilled in the art could not perform the claimed process without undue experimentation, see *In re Armbruster* 185 USPQ 152 CCPA 1975. Incorporation of the limitation of “a heterodiamondoid compound” into the claims respectively would obviate the rejection, i.e., formula I and limitation of the variable G (i.e., triamantane or tetramantane), limitation of a replaced heteroatom (i.e., Se, Al, N, P, or As), and variables R¹-R⁶, see page 7-9.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-21, and 26-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 26-28, recite limitation “comprising”, is ambiguous and indefinite, i.e., see claim 1, line 1. The instant claimed products are heterodiamondoid comprising a diamondoid nucleus. The instant claims recites the limitation “comprising”, which is an open-end language and comprise products other than heterodiamondoid or a diamondoid nucleus. Replacement of the limitation “comprising” with the limitation “consisting of”, would obviate the rejection, see page 7.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

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unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-21, and 26-37 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of Liu et al. copending Application No.10/622,046. Although the conflicting claims are not identical, they are not patentably distinct from each other and reasons are as follows.

Applicants claim a diamondoid compound having a heteroatom (i.e., Se, Al, N, P, or As). The compound is found on the pages 7-25 of the specification.

Liu et al. '046 claim a diamondoid material (i.e., compound) having a heteroatom (i.e., N, P, or As).

The difference between Liu et al. and instant claims is that there are no limitation of numbers of amantane or amantane nucleus.

One having ordinary skill in the art would find the instant claims 1-21, and 26-37 *prima facie* obvious **because** one would be employ the compounds of Liu et al., to obtain or prepare a compound, wherein the instant diamondoid compounds (i.e., heterodiamondoid compound) have a heteroatom (i.e., Se, Al, N, P, or As).

The motivation to make the claimed compounds derives from the expectation that the instant claimed diamondoid compound or heterodiamondoid compounds would possess similar characteristics or activities, i.e., a crystal, from the known Liu et al. compounds to that which is claimed in the reference.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Objection

10. Claims 1-21, and 26-37 are objected to as containing non-elected subject matter, i.e., heteroatom O, S, or Si, the functional groups of claim 34 not having heteroaryl or heterocycle, etc. It is suggested that applicants amend the claims to the scope of the elected subject matter as defined on the page 2 *supra*.

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Telephone Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Shiao whose telephone number is (571) 272-0707. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph K. McKane can be reached on (571) 272-0699. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R.S.-
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Patent Examiner
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for 
Joseph K. McKane
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April 06, 2005